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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/712,108	11/14/2003	Cheng-Tsung Yu	0941-0752P	8218

2292 7590 09/08/2005

BIRCH STEWART KOLASCH & BIRCH
PO BOX 747
FALLS CHURCH, VA 22040-0747

EXAMINER

MOORE, KARLA A

ART UNIT PAPER NUMBER

1763

DATE MAILED: 09/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/712,108

Applicant(s)

YU ET AL.

Examiner

Karla Moore

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 November 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>1103</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claim 21 is objected to because of the following informalities: It recites "The *method* as claimed in claim 20". Examiner has assumed the preamble was meant to read "The *pedestal* as claimed in claim 20". Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
3. Claims ~~20~~-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
4. Claim 20 recites the limitation "the insulating base" at line 10. There is insufficient antecedent basis for this limitation in the claim. Examiner has assumed the claim was meant to recite "the silicon oxide base".

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

6. Claims 1, 4 and 8 are rejected under 35 U.S.C. 102(a) as being anticipated by Applicants Admitted Prior Art.

7. Applicant's admitted prior art discloses a pedestal for supporting a substrate in a plasma chamber, comprising: an insulating base (Figure 1, 114); a conductive layer (120) on the insulating base; and a ceramic layer (116) at least partially covering the conductive layer, the conductive layer being covered when the pedestal supports the substrate.

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8. With respect to claim 4, the ceramic cover overlies the insulating base (see Figure 1).
9. With respect to claim 8, the insulating base comprises silicon oxide (page 1, paragraph 3 of specification).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary.

Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

12. Claims 2-3, 5-7 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art as applied to claims 1, 4 and 8 above in view of U.S. Patent No. 4,793,975 to Drage.

13. Applicant's Admitted Prior Art discloses the invention substantially as claimed and as described above.

14. However, Applicant's Admitted Prior Art fails to teach the conductive layer further comprises a bottom portion with a bottom width and an upper portion with an upper width, the upper width being less than the bottom width and a diameter of a substrate.

15. Drage teaches forming a conductive portion of a pedestal supporting apparatus comprising an annular groove forming a bottom portion and upper portion. The annular groove is used to contain a

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ceramic cover ring whose properties can be selected to improve uniformity and etch rate within a plasma reactor (see Figure 3; column 1, row 60 through column 2, row 2 and column 2, rows 53-62).

16. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided the conductive portion in the Applicant's Admitted Prior Art with an annular groove in order to contain a ceramic cover ring whose properties can be selected to improve uniformity and etch rate within a plasma reactor as taught by Drage.

17. With respect to claim 3, the insulating base of Applicant's Admitted Prior Art further comprises a recess accommodating the bottom portion of the conductive layer (see Figure 1).

18. With respect to claim 5, the ceramic cover ring of Drage further comprises an opening (14) exposing a the conductive layer.

19. With respect to claim 6, the ceramic cover overlies the bottom portion of the conductive layer and further comprises a hollow portion accommodating the upper portion of the conductive layer (see Figure 3 of Drage).

20. With respect to claim 7, the ceramic cover is ring shaped (see Figures 1 and 3).

21. With respect to claim 10, the ceramic cover comprises aluminum oxide (column 2, rows 53-62).

22. Claims 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art and Drage as applied to claims 2-3, 5-7 and 10 above and further in view of U.S. Patent Publication No. 2005/0098120 A1 to Maki.

23. Applicant's Admitted Prior Art and Drage disclose the invention substantially as claimed and as described above.

24. However, Applicant's Admitted Prior Art and Drage fail to teach the conductive layer as titanium. Maki teaches the use of titanium as a pedestal material for the purpose of forming a temperature controlling section with superior thermal conductivity, electric conductivity and formability (paragraph 46).

25. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided titanium as a construction material for the conductive layer in order to form a

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pedestal having a temperature controlling section with superior thermal conductivity, electrical conductivity and formability as taught by Maki.

26. Claims 11-17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art in view of U.S. Patent No. 4,793,975 to Drage.

27. Applicant's Admitted Prior Art discloses the invention substantially as claimed and comprising: a pedestal for supporting a substrate in a plasma chamber, comprising: an insulating base (Figure 1, 114) having a recess; a conductive layer (120) embedded in the recess; and a ceramic layer (116) overlying the insulating base and covering the covering the conductive layer, the conductive layer being covered when the pedestal supports the substrate.

28. However, Applicant's Admitted Prior Art fails to teach the ceramic cover only partially covering the conductive layer.

29. Drage teaches forming a conductive portion of a pedestal supporting apparatus comprising an annular groove forming a bottom portion and upper portion. The annular groove is used to contain a ceramic cover ring whose properties can be selected to improve uniformity and etch rate within a plasma reactor (see Figure 3; column 1, row 60 through column 2, row 2 and column 2, rows 53-62). The ceramic cover only partially covers a conductive layer.

30. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided the conductive portion in the Applicant's Admitted Prior Art with an annular groove in order to contain a ceramic cover ring whose properties can be selected to improve uniformity and etch rate within a plasma reactor as taught by Drage.

31. With respect to claims 12 and 13, the combination of Applicants admitted prior art and Drage disclose a layer comprising an upper portion, with a width less than the diameter of the substrate and the width of the other portion of the conductive layer, protruding from the recess.

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32. With respect to claims 14 and 15, the ceramic cover overlies the bottom portion of the conductive layer and further comprises a hollow portion accommodating the upper portion of the conductive layer and exposing the narrower upper portion of the conductive layer (see Figure 3 of Drage).

33. With respect to claim 16, the ceramic cover is ring shaped (see Figures 1 and 3).

34. With respect to claim 17, the insulating base comprises silicon oxide (page 1, paragraph 3 of specification).

35. With respect to claim 19, the ceramic cover comprises aluminum oxide (column 2, rows 53-62).

36. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art and Drage as applied to claims 11-17 and 19 above and further in view of U.S. Patent Publication No. 2005/0098120 A1 to Maki.

37. Applicant's Admitted Prior Art and Drage disclose the invention substantially as claimed and as described above.

38. However, Applicant's Admitted Prior Art and Drage fail to teach the conductive layer as titanium. Maki teaches the use of titanium as a pedestal material for the purpose of forming a temperature controlling section with superior thermal conductivity, electric conductivity and formability (paragraph 46).

39. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided titanium as a construction material for the conductive layer in order to form a pedestal having a temperature controlling section with superior thermal conductivity, electrical conductivity and formability as taught by Maki.

40. Claims 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art in view of U.S. Patent No. 4,793,975 to Drage and U.S. Patent Publication No. 2005/0098120 A1 to Maki.

41. Applicant's Admitted Prior Art discloses the invention substantially as claimed and comprising: a pedestal for supporting a substrate in a plasma chamber, comprising: a silicon-oxide base (Figure 1, 114; page 1, paragraph 3 of specification) having a recess; a conductive layer (120) embedded in the recess;

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and a ceramic layer (116) overlying the insulating base and covering the covering the conductive layer, the conductive layer being covered when the pedestal supports the substrate.

42. However, Applicant's Admitted Prior Art fails to teach the conductive layer having a bottom portion embedded in the recess and an upper portion narrower than the bottom portion protruding from the recess or the ceramic cover as ring-shaped and having a hollow portion accommodating the upper portion of the conductive layer overlying the silicon-oxide base and a portion of the bottom portion of the conductive layer.

43. Drage teaches forming a conductive portion of a pedestal supporting apparatus comprising an annular groove forming a bottom portion and upper portion. The annular groove is used to contain a ceramic cover ring whose properties can be selected to improve uniformity and etch rate within a plasma reactor (see Figure 3; column 1, row 60 through column 2, row 2 and column 2, rows 53-62). The bottom portion would rest in the silicon oxide base of the Applicant's Admitted Prior Art. The ceramic cover only partially covers a conductive layer.

44. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided the conductive portion in the Applicant's Admitted Prior Art with an annular groove in order to contain a ceramic cover ring whose properties can be selected to improve uniformity and etch rate within a plasma reactor as taught by Drage.

45. Applicant's Admitted Prior Art and Drage disclose the invention substantially as claimed and as described above.

46. However, Applicant's Admitted Prior Art and Drage fail to teach the conductive layer as titanium. Maki teaches the use of titanium as a pedestal material for the purpose of forming a temperature controlling section with superior thermal conductivity, electric conductivity and formability (paragraph 46).

47. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided titanium as a construction material for the conductive layer in order to form a pedestal having a temperature controlling section with superior thermal conductivity, electrical conductivity and formability as taught by Maki.

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48. With respect to claim 21, the hollow portion of the ceramic cover further exposes the upper section of the conductive layer (see Figure 3 of Drage).

49. With respect to claim 22, the ceramic cover comprises aluminum oxide (column 2, rows 53-62).


Conclusion

50. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. USP 4968374; 5271788; 6167836; and 6475336 each disclose substrate pedestals for plasma apparatus.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karla Moore whose telephone number is 571.272.1440. The examiner can normally be reached on Monday-Friday, 9:00 am-6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571.272.1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Karla Moore
Patent Examiner
Art Unit 1763
6 September 2005